

PATENT
Serial No. 10/520,315
Amendment in Reply to Office Action mailed on February 5, 2007

IN THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1.(Currently Amended) Polycrystalline alumina components optionally containing MgO in a concentration of at most 0.3 wt-% ~~characterized in that, wherein~~ the alumina contains a concentration from 0.1 to 0.5 wt-% inclusive ZrO_2 ~~inclusive~~ as an additive and has an average crystal size $\leq 2 \mu\text{m}$, ~~and a relative density higher than 99.95%, and is transparent~~ with a real in-line transmission $\text{RIT} \geq 30\%$ measured over an angular aperture of at most 0.5° at a sample thickness of 0.8 mm and with a monochromatic wavelength of light λ .

2.(Currently Amended) ~~Polycrystalline~~ The polycrystalline alumina components according to claim 1, ~~characterized in that wherein~~ the average crystal size is $\leq 1 \mu\text{m}$ and the real in-line transmission RIT is at least 40%.

3.(Currently Amended) ~~Polycrystalline~~ The polycrystalline alumina components according to claim 1, ~~characterized in that wherein~~ the ZrO_2 additive is in a concentration from 0.1 wt-% to 0.3 wt-%, inclusive.

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4. (Currently Amended) ~~Discharge~~ A discharge lamp characterized in that the lamp is ~~provided with comprising~~ a discharge tube having a wall of a ceramic as claimed in claim 1.

5. (Currently Amended) ~~Lamp~~ The discharge lamp according to claim 4 characterized in that ~~wherein~~ the discharge tube has an ionisable filling containing a metal halide.

6. (Currently Amended) ~~Method~~ A method for forming a polycrystalline alumina component as claimed in claim 1 ~~characterized in that the process wherein the method includes the steps acts of~~ preparing a slurry of corundum power with a mean grain size $\leq 0.2 \mu\text{m}$,
adding a dopant, selected from zirconia and a zirconium containing precursor,
casting the slurry in a mould to form a moulded body, drying and sintering of the moulded body thus formed, and
performing a HIP treatment at a temperature of at least 1150°C . for at least 2 hours.

7. (Currently Amended) ~~Method~~ The method according to claim 6, wherein the dopant is added as finely grained ZrO_2 .

8. (Currently Amended) ~~Method~~ The method according to claim 6, wherein the finely grained ZrO_2 -dopant has an average particle size of at most 100 nm.

9. (Currently Amended) ~~Method~~ The method according to claim 6, wherein after the addition

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~~of the zirconia dopant adding act,~~ the prepared slurry is slip cast in a mould.

10.(Currently Amended) ~~Method~~The method according to claim 6, wherein after the addition of the zirconia dopant the prepared slurry is gel cast in a mould.

11.(Currently Amended) Polycrystalline alumina components ~~characterized in that the~~
comprising alumina which contains a concentration between 0.1 to 0.5wt-% inclusive as an additive,
has an average crystal size $\leq 2 \mu\text{m}$, ~~and has a relative density higher than 99.95%, and is transparent.~~

12.(Currently Amended) The Polycrystalline alumina components of claim 11 ~~further~~
~~characterized in that,~~ wherein the alumina contains MgO in a concentration of at most 0.3 wt-%.

13.(Currently Amended) ~~Discharge~~A discharge lamp ~~characterized in that the is provided~~
~~with~~comprising a discharge tube having a wall of a ceramic as claimed in claim 11.

14.(Currently Amended) ~~Method~~A method for forming a polycrystalline alumina
component as claimed in claim 11 ~~characterized in that,~~ wherein the ~~process method~~
~~steps acts of:~~

preparing a slurry of corundum power with a mean grain size $\leq 0.2 \mu\text{m}$,

adding a dopant, selected from zirconia and a zirconium containing precursor,

casting the slurry in a mould to form a moulded body, drying and sintering of the moulded

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body thus formed, and

performing a HIP treatment at a temperature of at least 1150° C. for at least 2 hours.

15.(New) The Polycrystalline alumina components of claim 11, wherein the transparency of the alumina is at least 30% having a real in-line transmission $RIT \geq 30\%$ measured over an angular aperture of at most 0.5° at a sample thickness of 0.8 mm and with a monochromatic wavelength of light λ .

16.(New) The polycrystalline alumina components of claim 11, wherein the RIT is based on a following relationship:

$$RIT = (1 - R) \exp\left(-\frac{3\pi^2 G d \Delta n^2}{2\lambda_0^2}\right)$$

where

R is a coefficient of surface reflection,

d is the sample thickness,

G is the average crystal size,

Δn is an effective birefringence of alpha-alumina calculated as a weighted average of refractive index differences between each of main optical axes, and

λ_0 is the monochromatic wavelength of the light in vacuum.